WHAT IS CLAIMED IS:

1. A separation system for separating liquid components of differing densities from a fluid mixture, the system comprising:

a flow conditioning apparatus and a cooperating liquid separation apparatus disposed downstream from and in fluid communication with the flow conditioning apparatus;

the flow conditioning apparatus having an inlet, an outlet and a swirl chamber extending along a curvilinear swirl axis and located between the inlet and the outlet, the inlet and outlet being configured to cooperate with the swirl chamber to induce the swirling of a fluid mixture about the swirl axis such that when a fluid mixture having liquid components of differing densities passes through the swirl chamber, centrifugal forces are imparted upon the liquid components to induce coalescence of droplets in at least one of the liquid components;

and the liquid separation apparatus being capable of separating liquids of differing densities;

wherein the existence of the coalesced droplets in a fluid mixture received from the cooperating flow conditioning apparatus by the separation apparatus enhances the separation efficiency of the liquid separation apparatus.

2. The system of claim 1 wherein at least one of the inlet and the outlet is configured to direct a fluid mixture to flow generally circumferentially about the swirl axis to induce the swirling of a fluid mixture in the swirl chamber when passing through the swirl chamber.

3. The system of claim 1 wherein at least one of the inlet and the outlet is configured to direct a fluid mixture generally tangentially to a surface enclosed by an inner wall of the swirl chamber to induce the swirling of a fluid mixture when passing through the swirl chamber.

4. The system of claim 2 wherein both the inlet and the outlet are configured to direct a fluid mixture to flow generally circumferentially about the swirl axis to induce the swirling of a fluid mixture when passing through the swirl chamber.

5. The system of claim 1 wherein the inlet directs a fluid mixture into the swirl chamber at a distance offset from the swirl axis to induce the fluid mixture to swirl helically about the swirl axis.

6. The system of claim 1 wherein the inlet includes an inlet opening and the flow control apparatus includes a movable closure which cooperates with the inlet to control the size of the inlet opening.

7. The system of claim 1 wherein the outlet includes an outlet opening which directs a fluid mixture to flow generally tangentially to the curved surface enclosed by the swirl chamber as the fluid mixture passes through the outlet opening.

8. The system of claim 1 wherein the outlet includes a plurality of orifices.

9. The system of claim 8 wherein the plurality of orifices are arranged in a spiral configuration relative to the swirl axis.

10. The system of claim 8 wherein the orifices have peripheries which are generally elongate and curved.

11. The system of claim 1 wherein the flow conditioning apparatus includes a plunger which moves relative to the outlet to control the flow of fluid through the outlet.

12. The system of claim 1 wherein the swirl chamber is annular and is at least partially formed by cooperating inner and outer cylinders.

13. The system of claim 12 wherein the outlet includes a plurality of spaced apart orifices formed in the inner cylinder.

14. The system of claim 13 wherein the orifices are arranged in a spiral configuration relative to the swirl axis.

15. The system of claim 13 wherein the flow conditioning apparatus includes a movable member which moves relative to the orifices to adjust through which of the orifices the fluid mixture may pass.

16. The system of claim 13 wherein the orifices are elongate and curved in periphery and direct a fluid mixture passing therethrough to spiral about the swirl axis

17. The system of claim 13 wherein the flow conditioning apparatus includes a movable member which moves relative to the orifices to control through which of the orifices the fluid mixture may pass.

18. The system of claim 1 wherein the flow conditioning apparatus acts as a choke to substantially reduce the pressure of a fluid mixture passing through the flow conditioning apparatus.

19. The system of claim 1 wherein the swirl chamber has a spiral vane disposed therein to induce the fluid mixture to swirl when passing through the swirl chamber.

20. The system of claim 1 wherein the swirl chamber is at least partially formed by a pair of substantially out of plane elbows which induce a fluid mixture to swirl when passing through the swirl chamber.

21. The system of claim 1 wherein the flow conditioning apparatus is a control valve which controls the rate of flow.

22. The system of claim 1 further comprising a gas separation apparatus disposed upstream of and in fluid communication with the flow conditioning apparatus.

23. The system of claim 1 wherein the liquid separation apparatus is an oil and water separator.

24. The system of claim 1 wherein the separation apparatus is one of a gravity separator, a hydrocyclone, and a membrane separator.

25. The system of claim 1 further comprising a wellhead for an oil producing well disposed upstream from and in fluid communication with the flow conditioning apparatus.

26. A method of separating liquid components of differing densities from a fluid mixture, the method comprising the steps of:

passing a fluid mixture having liquid components of differing densities through a flow conditioning apparatus, the flow conditioning apparatus having an inlet with an inlet opening, an outlet with an outlet opening; and

OR

a swirl chamber disposed there between with the inlet and outlet being configured relative to the swirl chamber such that the flow of the fluid mixture through the inlet to the swirling chamber and out the outlet induces swirling of the fluid mixture with droplets of at least one of the liquid components coalescing; and

passing the fluid mixture to a cooperating liquid separator apparatus wherein the liquid components of differing densities are separated with the efficiency of the separator apparatus being enhanced by the existence of the coalesced droplets created by the flow conditioning apparatus.

27. The method of claim 26 wherein the liquids, which are separated, are received from a wellbore.

28. The method of claim 26 wherein:

the swirl chamber extends along a swirl axis; and

at least one of the inlet and the outlet directs the fluid mixture to flow generally circumferentilly about the swirl axis.

29. The method of claim 28 wherein:

the outlet includes a plurality of orifices.

30. The method of claim 29 wherein:

the orifices are configured to direct the fluid mixture passing therethrough generally circumferentially about the swirl axis.

31. The method of claim 26 further comprising the step of:

adjusting the size of at least one of the inlet opening and the outlet opening to control the rate of flow through the flow conditioning apparatus.

32. The method of claim 31 wherein:

the flow conditioning apparatus acts as a choke to substantially reduce the pressure of the fluid mixture passing therethrough.

33. The method of claim 26 wherein:

the flow conditioning apparatus includes a pair of out of plane elbows which induce swirling of the fluid mixture passing there through.

34. The method of claim 26 wherein:

the flow conditioning apparatus includes a movable closure to control the rate of flow through the flow conditioning apparatus.

35. The method of claim 26 wherein:

at least one of the inlet opening and the outlet opening includes a plurality of orifices which direct fluid flowing therethrough to helical swirl about the swirl axis.

36. The method of claim 26 wherein:

the swirl chamber is formed by a cylinder and the inlet includes a plurality of inlets which are configured to direct the fluid mixture to flow generally circumferentially about the swirl axis to create a helical flow.

37. The method of claim 36 wherein:

the flow control apparatus is disposed down hole in a wellbore; and

a fluid mixture enters the orifices and swirls to separate oil and water received from an oil production zone in the wellbore.

38. A flow conditioning apparatus for conditioning a fluid mixture which has liquid components of differing densities, the flow conditioning apparatus comprising:

an inlet, an outlet, and a swirl chamber extending along a curvilinear swirl axis, the inlet and outlet being configured to cooperate with the swirl chamber to induce a fluid mixture having liquid components of differing densities to swirl when passing through the swirl chamber.

39. The flow conditioning apparatus of claim 38 further comprising a closure member including a plunger which moves relative to the swirl chamber and which controls the flow of a fluid mixture passing through the fluid control apparatus.

40. The flow conditioning apparatus of claim 39 wherein:

the swirl chamber is annular and is formed by an inner cylinder and an outer cylinder

41. The flow conditioning apparatus of claim 40 wherein:

a closure member move relative to the swirl chamber to control the flow of fluid through the swirl chamber.

42. The flow conditioning apparatus of claim 40 wherein:

the inner cylinder has an outlet including a plurality of orifices.

43. The flow conditioning apparatus of claim 42 wherein:

the plurality of orifices are arranged in a spiral pattern about the swirl axis.

44. The flow conditioning apparatus of claim 42 wherein:

the orifices are configured to direct a fluid mixture, passing through the orifices, generally circumferentially about the swirl axis..

45. The flow conditioning apparatus of claim 44 wherein:

at least one of the orifices has peripheries which are generally elongated and curved in shape.

46. The flow conditioning apparatus of claim 40 further comprising:

an exit conduit in fluid communication with the outlet.

47. The flow conditioning apparatus of claim 41 further comprising:

a drive mechanism for controlling the movement of the closure member.

48. The flow conditioning apparatus of claim 47 wherein:

the inlet includes an inlet conduit which extends generally perpendicular to the swirl chamber and is offset from the swirl axis so as to introduce a fluid mixture into the swirl chamber generally tangentially to the curved surface enclosed by the swirl chamber.

49. The flow conditioning apparatus of claim 38 further comprising:

a movable closure member which moves relative to the inlet to control the flow of fluid through the apparatus.

50. The flow conditioning apparatus of claim 49 wherein:

the movable closure member is a spiral vane disposed in the swirl chamber and a fluid mixture spirals about the vane when passing through the swirl chamber.

51. The flow conditioning apparatus of claim 50 wherein:

the spiral vane moves relative to the inlet chamber to vary the length of contact between a fluid mixture passing through the swirl chamber and the spiral vane.

52. A flow conditioning apparatus comprising:

an inlet, and outlet and a swirl chamber disposed there between and extending along a swirl axis; and

an adjustable closure member for adjusting the rate of flow through one of the inlet opening and the outlet opening;

wherein fluid helical swirls about the swirl axis when passing through the flow conditioning apparatus.